APES Tool Manual

Version: v2.5.0

Contents

1. Introduction

Dear APES User

This step-by-step manual is designed as an introduction to APES and is mainly aimed at beginners using APES for the first time. Advanced APES users may also consider recent publications using APES. For an extensive publication list, visit http://www.apes-tool.ch/publications.html

Whenever using and publishing please cite as:

Uwe Serdült, Thomas Widmer (2020)
APES Actor Process Event Scheme Tool.
University of Zurich, Switzerland

2. APES Download/ installation

The APES download is free for non-commercial use. APES can be downloaded from the APES webpage (www.apes-tool.ch).

The APES download is available to users running Mac OS X and Windows. APES runs on a Java Runtime Environment (JRE), minimum version 11.

Choose either "Download for Windows/OSX users", respectively "Download for Mac users" and follow the instructions of the installation wizard.

3. Create a new scheme

1. Open APES Tool.

2. Go to “File” menu,

    - Choose “New” for creating a new scheme or also use shortcut Ctrl-N.

    - Choose “Open” for opening other APES-files or also use shortcut Ctrl-O.

    - Choose “Import” to import excel files. APES tool supports two excel templates: xlsx version and xls version. To import excel, choose “Import” option from file menu or also use shortcut Ctrl-I.

    Note: We recommend you use the xlsx version. This is because the data validation feature in xlsx is not fully supported in xls.

3. To edit title, go to “Edit” menu,

    - Choose “Edit Title”.

    - Enter the title of your scheme into the corresponding field.

    - Press “Apply” or ENTER (see figure 2.1).

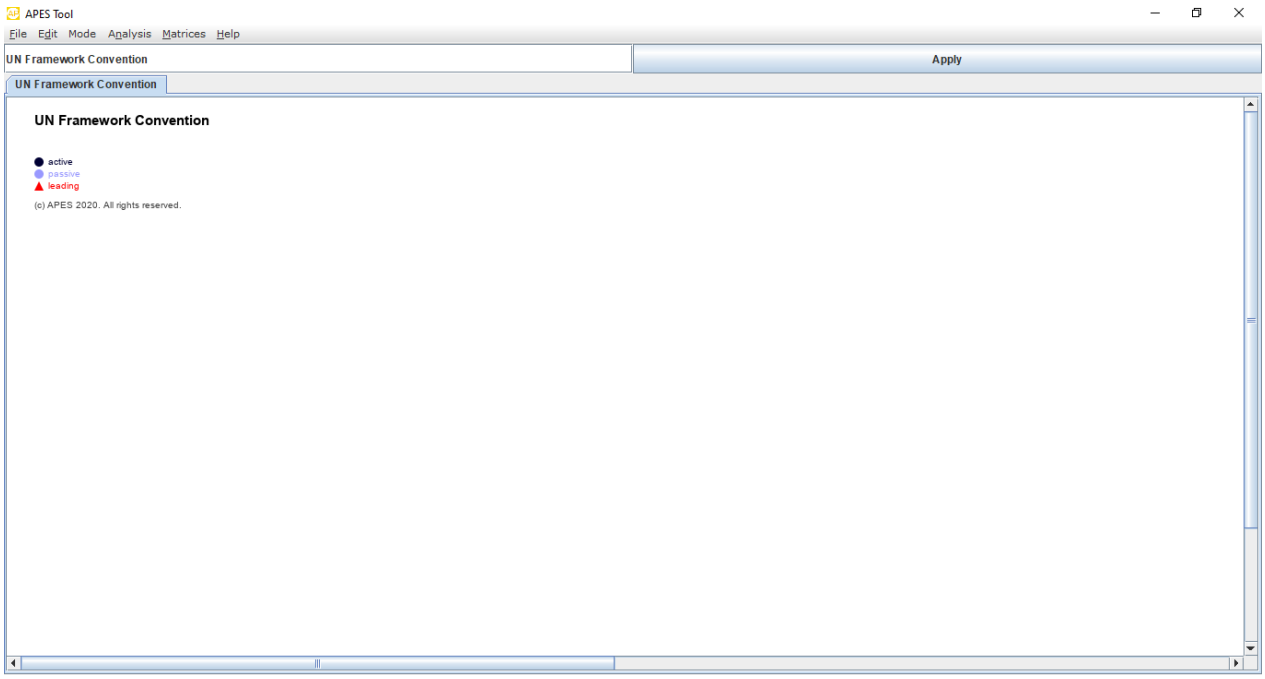


Figure 2.1 Create a new scheme

4. Create a new root level

Create a new root level

1. To create a new root level

   - Go to Edit menu.
   - Choose Add a new root level.
   - Enter the name of the root level into the corresponding field.
   - Press Add or Enter.

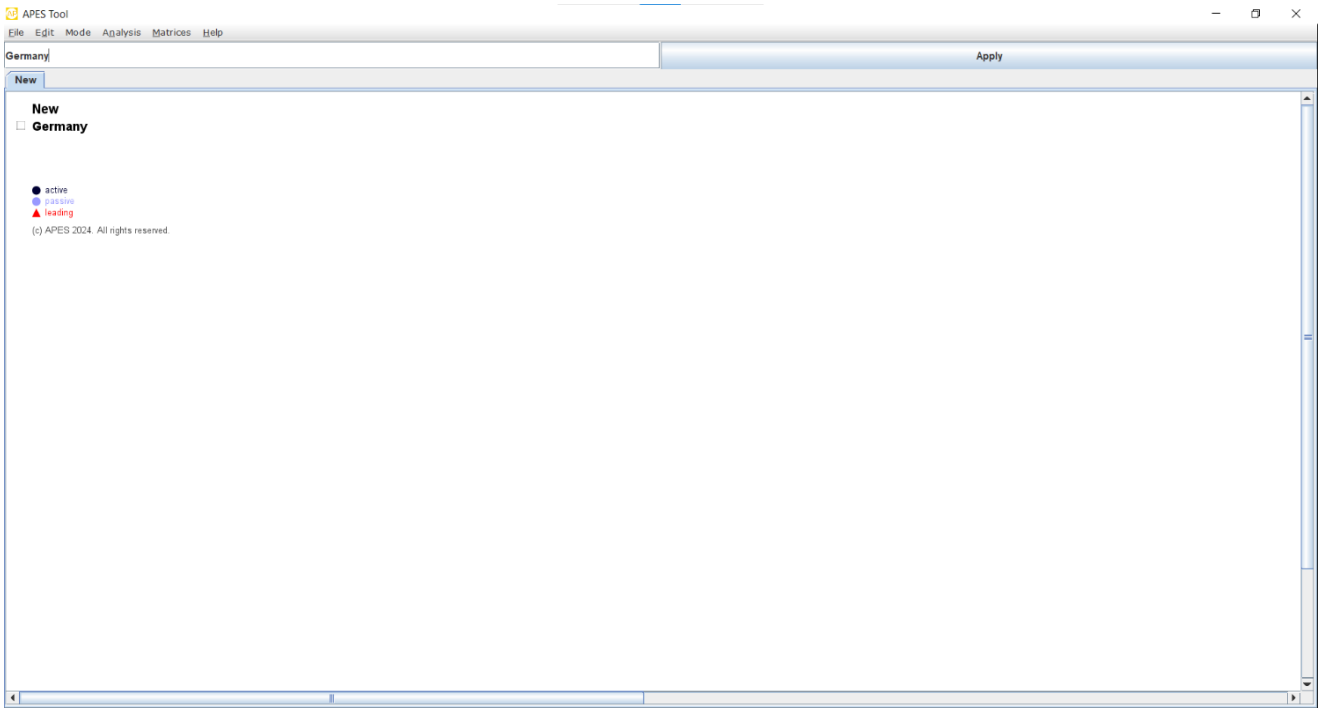


Figure 3.1: Create or edit root level

5. Create actor groups/ actors

Create actor groups

1. To create an actor group:

    - Go to “Edit”.
    - Choose “Add a new actor group”.
    - Enter the name of your first actor group into the corresponding field.
    - Press “Add” or ENTER.

    For any additional actor group, repeat this procedure as often as necessary also shortcut Alt-G.

2. For editing the name or the order of any actor group within the scheme:

    - Put the cursor on the small box placed left of each actor group name.
    - Make a right-click on your mouse, a window appears.
    - Within this window, choose the option “Edit” and alter your data

      entry for this actor group or change the order of the actor group by pressing either “move up” or “move down”.
    - Confirm by pressing “Apply” or ENTER (see figure 3.1).

    Note: You can add an actor group only after adding at least one root level. Each actor group must be associated with a root level.

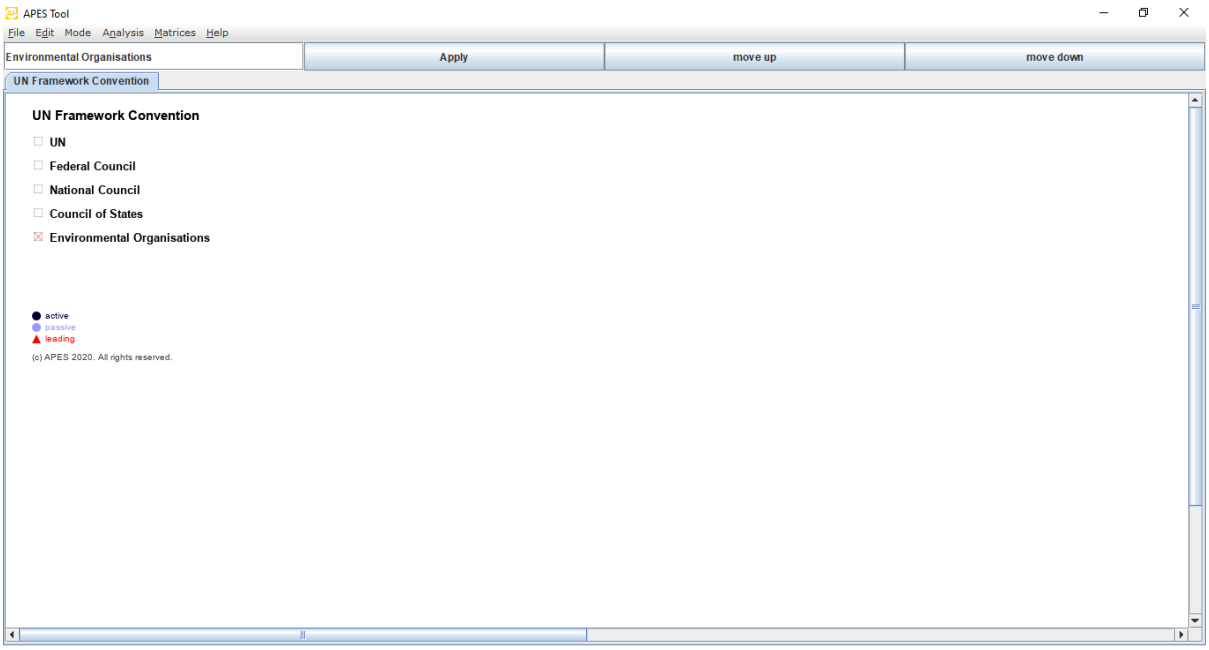


Figure 3.1: Create or edit an actor group

Create actors

1. To create an actor:

    - Go to “Edit”.
    - Choose “Add new actor”.
    - Choose first the actor group in which the corresponding actor is to be placed.
    - Enter then the name of the new actor into the corresponding field.
    - Press “Add” or ENTER.

    For any additional actor, repeat this procedure as often as necessary also shortcut Alt-A.

    Note*: *Do not forget to always choose the correct actor group in which the corresponding actor is to be placed.

2. For editing the name or the order of any actor within the scheme:

    - Put the cursor on the small box placed left of each actor name.
    - Make a right-click on your mouse, a window appears.
    - Within this window, choose the option “Edit” and alter your data entry for this actor or change the order of the actor within his actor group by pressing either “move up” or “move down”.
    - Confirm by pressing “Apply” or ENTER (see figure 3.2).

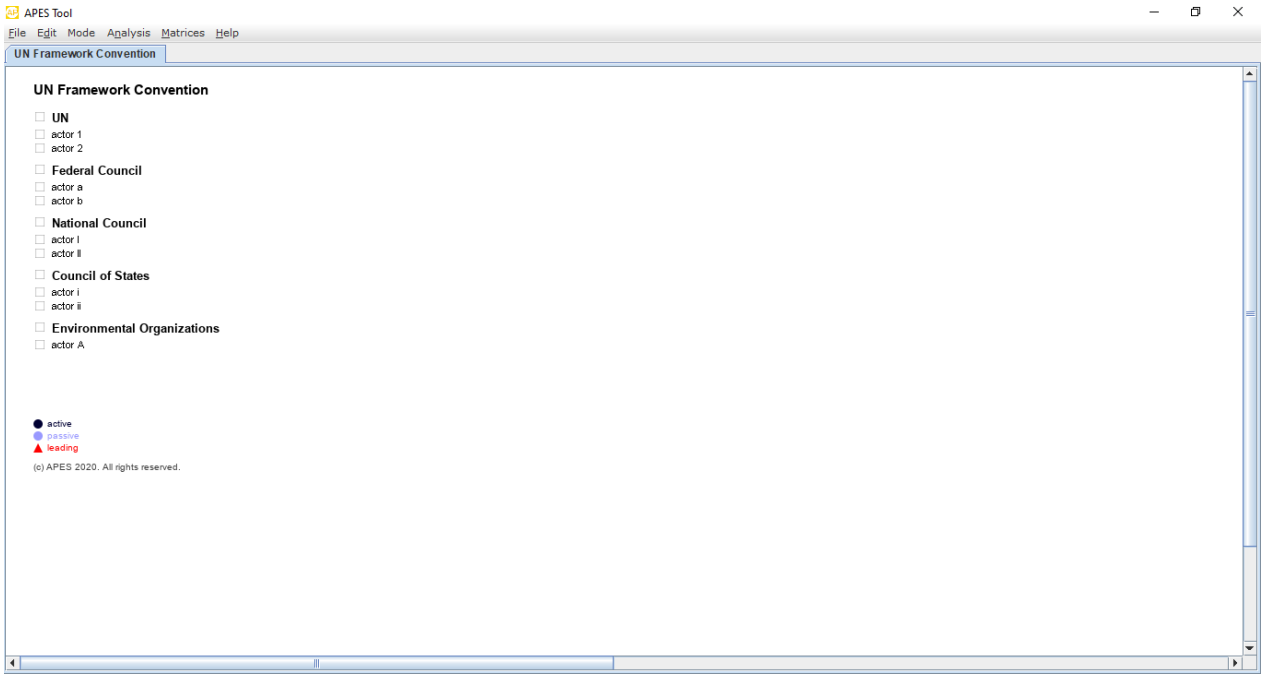


Figure 3.2 Create or edit an actor

6. Create phases/ events

Create phases

1. To create a phase:

    - Go to “Edit”.
    - Choose “Add a new phase”.
    - Enter name of your first phase into the corresponding field.
    - Press “Add” or ENTER.

    For any additional phase, repeat this procedure as often as necessary also shortcut Alt-P.

2. For editing the name or the order of any phase:

    - Put the cursor on the small box placed below each phase label.
    - Make a right-click on your mouse, a window appears.
    - Within this window, choose “Edit” and alter your data entry for this particular phase or change the order of the phase by pressing either “move left” or “move right”.
    - Confirm by pressing “Apply” or ENTER (see figure 4.1).

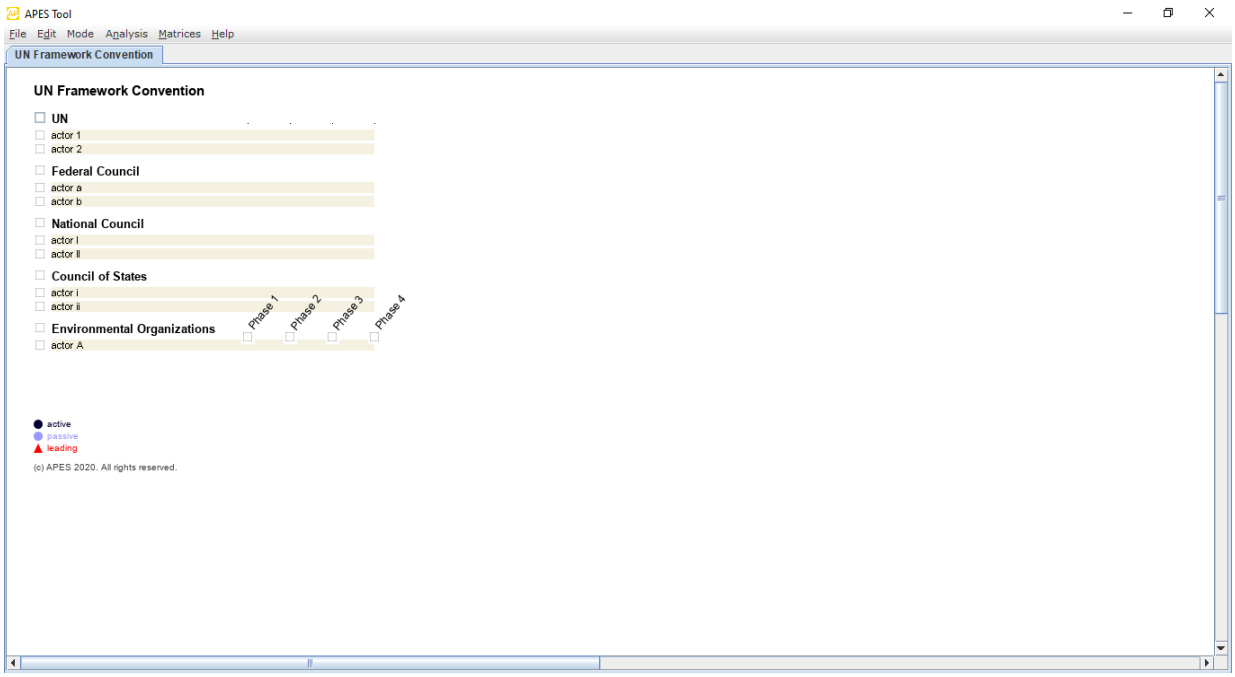


Figure 4.1 Create or edit a phase

Create events

1. To create events:

    - Go to “Edit”.
    - Choose “Add a new event”.
    - Choose first the phase in which the corresponding event takes place.
    - Enter then the name of the new event into the corresponding field.
    - Press “Add” or ENTER.

2. To set the date for this new event:

    - Press “Set the date”, a calendar window opens.
    - Choose the correct date on which this event took place.
    - Enter once again the year in which this event took place in the first field (as default the value 0 is being set).
    - Press “Apply” or ENTER.

    For any additional event, repeat this procedure as often as necessary also shortcut Alt-E.

    Note: Do not forget to always choose the correct phase in which the corresponding event took place.

3. For editing the name or the order of any event within a phase:

    - Put the cursor on the small box placed above each event label.
    - Make a right-click on your mouse, a window appears.
    - Within this window, choose the option “Edit” and alter your data entry for this event or change the order of this event by pressing either “move up” or “move down”.
    - Confirm by pressing “Apply” or ENTER (see figure 4.2).

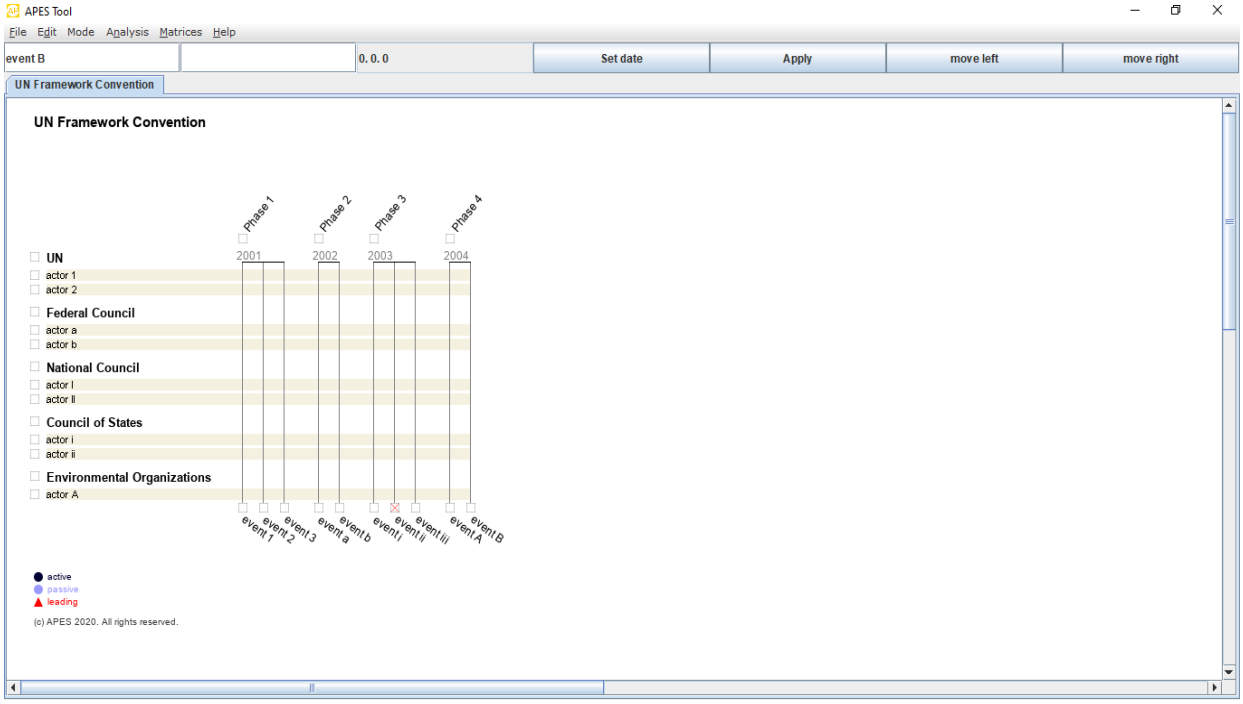


Figure 4.2 Create or edit events

7. Create relations

1. To create relations:

    - Go to “Edit”.
    - Choose “Add a new relation”.
    - Choose the actor that is to be related to an event.
    - Choose the corresponding event.
    - Set a relation attribute, if applicable (by default all relations are set as “active”, choose “passive” for a passive participation, or “leading” for a leading function of this particular actor for this particular event, ***see Step 6 of this manual for information on how to edit the name***).
    - If applicable, enter a tool tip info into the corresponding field.
    - Press “Add” or ENTER (see figure 5.1).

    For any additional relation, repeat this procedure as often as necessary also shortcut Alt-R (***Relation attribute can also be added by simply double-clicking directly into the scheme at the point where a relation needs to be created***).

2. For changing relations per event:

    - Move your cursor to the participation symbol you want to alter (node or triangle).
    - Make a right-click on your mouse, a window appears.
    - Within this window, choose the option “Change participation”.
    - By clicking this option, the chosen participation symbol alters automatically between dark- or light-colored node (active or passive participation) and triangle (leading participation). Click this option repeatedly until your preferred participation symbol appears.

3. For deleting a relation:

- Move your cursor to the participation symbol you want to delete (node or triangle).
- Make a right-click on your mouse, a window appears.
- Within this window, choose the option “Delete”.

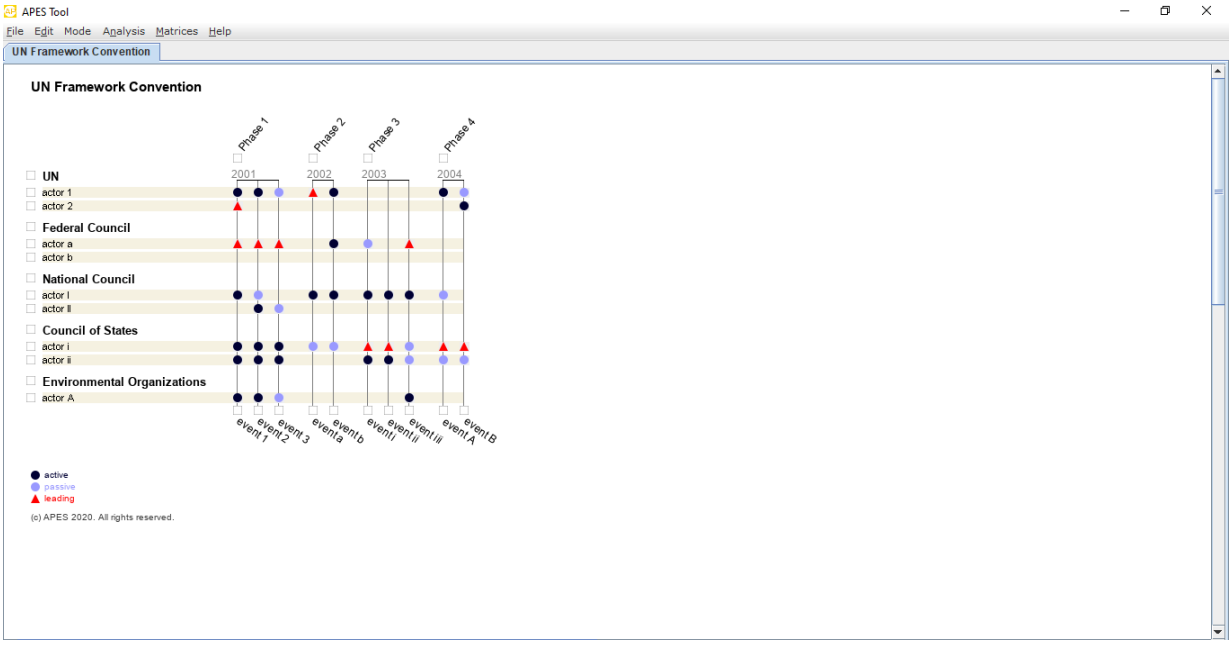


Figure 5.1 Create relations

8. Edit and weight relations/ choose stripe color

By default, APES proposes three labels for relations within a scheme (“active”, “passive”, and “leading”). These labels correspond with a certain weighting value per label (active=1, passive=2, leading=3), which is then reflected in the generated matrix per scheme (but not in the visualized scheme itself). Both the labels and the weighting value per label can be edited, however. In this version of APES Tool, a new color palette called DUST color palette is added to the existing color palette (See figure 6.2)

To do so, follow the instructions below (see figure 6.1):

1. Go to “File” menu

    - Choose “Preferences” or use shortcut Ctrl-P.

    - A window showing both relation type descriptions and relation values opens.

2. For editing labels or weighting values, just click your cursor into the corresponding field and enter your text and figures.

3. If only one participation type is needed, tick the corresponding box. All symbols within the scheme will then be displayed as dark colored dots (symbol for active participation).

4. Within this feature, the color of the stripes of the scheme can be chosen. To do so:

    - Click on the “Choose” button and select your preferred stripe color from the color palette opened as shown in Figure 6.2

    - Press “Apply”.

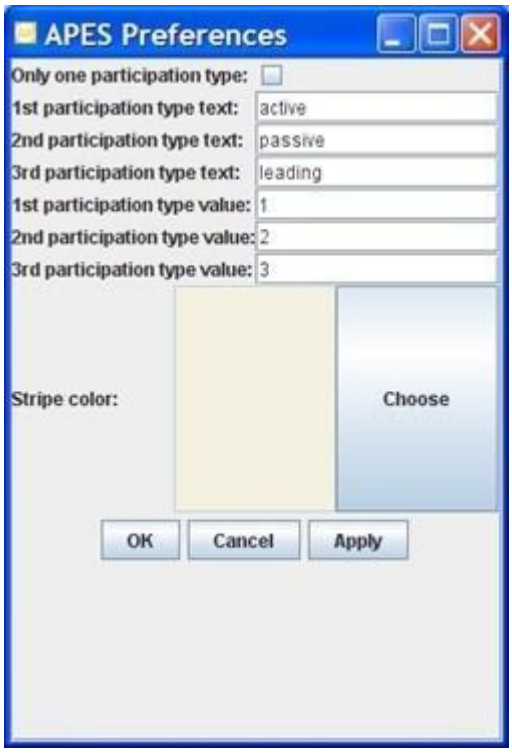


Figure 6.1 Edit and weight relations/ Choose stripe color

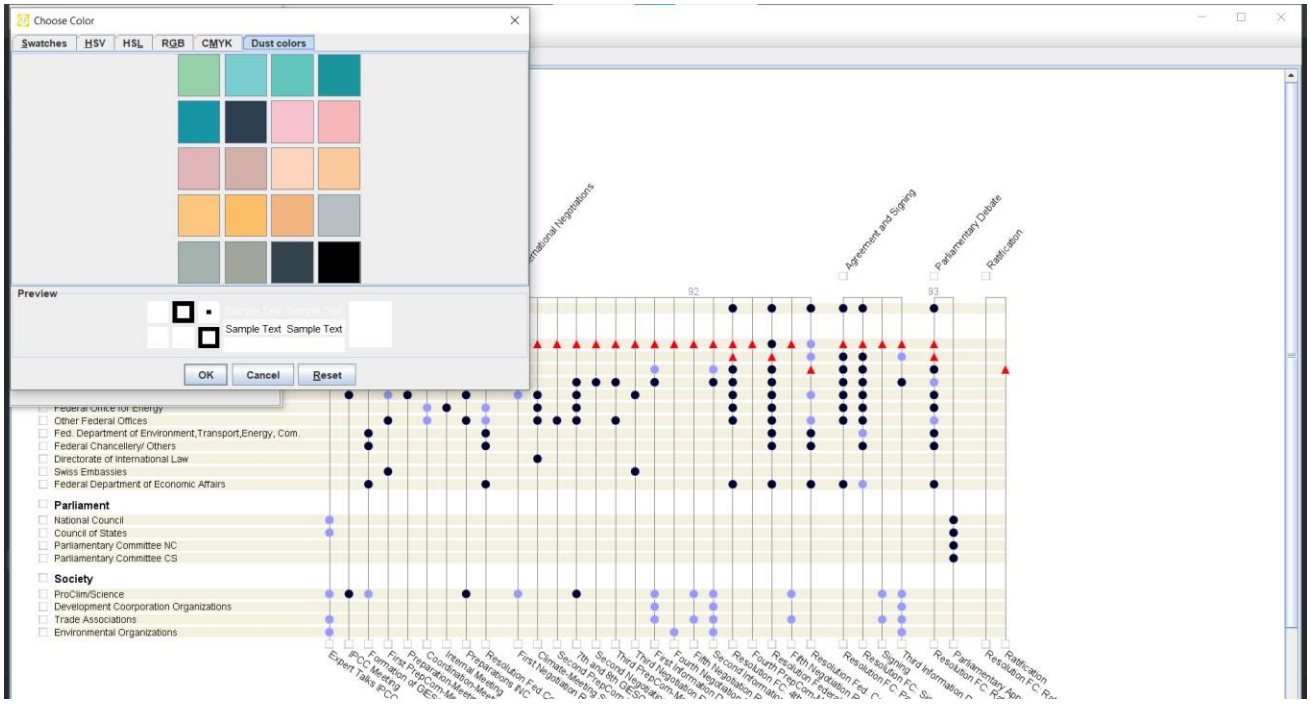


Figure 6.2 Dust color palette

9. Edit actor relation types

By default, APES suggests a symmetric interaction between all actors participating in the same event which is represented by a symmetric actor-actor matrix. Since a symmetric interaction does not always correspond to empirical findings though, APES provides additional actor relation types. The user can therefore choose between a symmetric relation (by default), or asymmetric sender relations ("cycle" or "chain").[1]

To edit actor relation types, follow the instructions below:

1. Move your cursor to the small box above the event for which you want to edit the actor relation type

   - Make a right-click on your mouse, a window appears.
   - Within this window, choose the option "Edit actor relation", a window showing relations between all participating actors for this event appears (by default, all relations are symmetric, see figure 7.1).

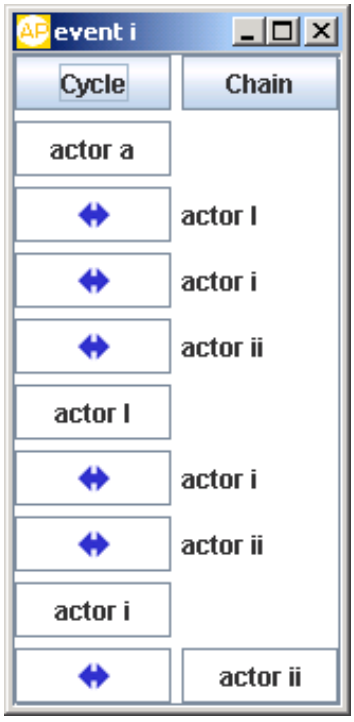


Figure 7.1 Symmetric actor relation type (by default)

2. To change the actor relation type given by default, choose either the “Cycle” or the “Chain” actor relation type. A “Cycle” actor relation type suggests a circular participation type, which defines no starting, and no ending point. However, the participation of the involved actors is not reciprocal, but directional (see figure 7.2).

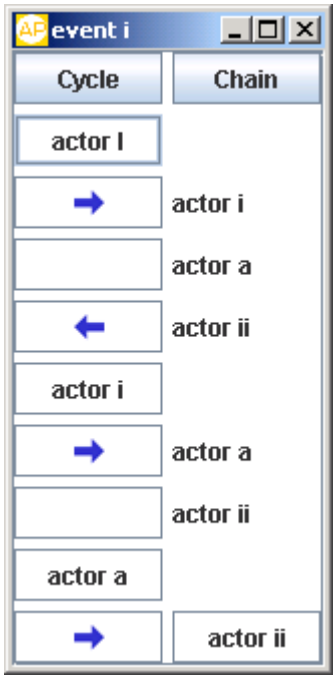


Figure 7.2 Asymmetric actor relation types (Cycle)

[1] In the current version, APES only provides a symmetric actor-actor matrix.

3. In contrast, a “Chain” actor relation type suggests a linear participation type, which defines a starting, and an ending point. The participation of the involved actors is therefore again not reciprocal, but directional (see figure 7.3).

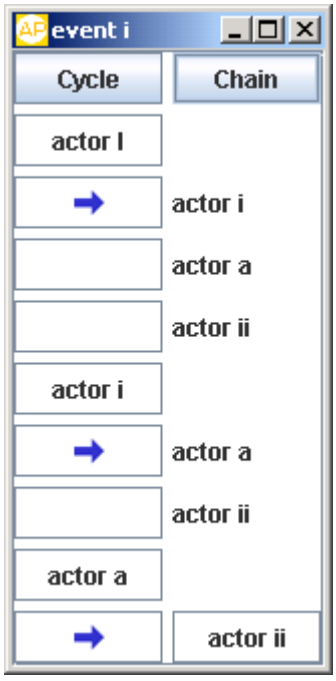


Figure 7.3 Asymmetric actor relation types (Chain)

4. Within both the “Cycle” and the “Chain” actor relation types, the user can edit singular relations. To do so,

   - Move your cursor on the arrow-symbol of the actor relation you want to edit.

   - Click the arrow-symbol you want to edit repeatedly, until your preferred arrow-symbol appears. Choose the double arrow for a symmetric relation (↔), the arrow pointing to the right-hand side for an asymmetric sender relation (→), or the arrow pointing to the left-hand side for an asymmetric receiver relation (←).

5. APES also provides two typical actor relation types stemming from Social Network Studies. A relation can either be designed as “sending star” or “receiving star”, which is a variation of both, the “Cycle”- and the “Chain”-actor relation types. To do so,

    - Make a right-click on the actor boxes within this window.

    - A second window opens, in which you can either choose to move a certain actor up or down the actors list or choose the “sending star”- or “receiving star”-actor relation. By doing so, the arrows will alter accordingly (see figure 7.4).

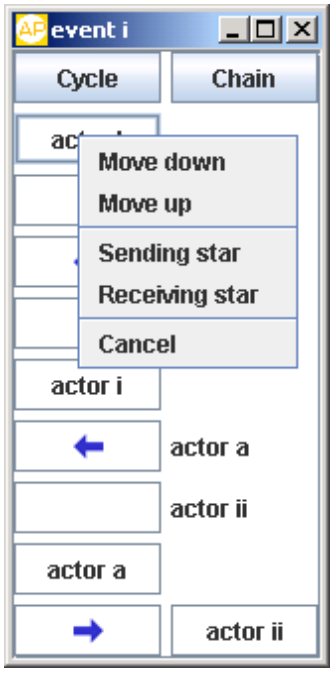


Figure 7.4 Edit actor relation types

10. Hide/ aggregate data

Hide data

1. Event names can be hidden. To do so:

    - Make a right-click on your mouse, a window appears.
    - Within this window, choose the option “Hide event names”.

2. Hidden event names can be reset. To do so:

    - Make a right-click on your mouse, a window appears.
    - Within this window, choose the option “Show event names”.

3. All items within the scheme can be hidden (actor groups, actors, phases, events). To do so:

    - Choose the items to be hidden by ticking the boxes above, below or left of the corresponding item.
    - Make a right-click on your mouse, a window appears.
    - Within this window, choose the option “Hide selected items”.

4. Hidden items can be reset. To do so:

    - Make a right-click on your mouse, a window appears.
    - Within this window, choose the option “Show hidden items”.

Aggregate data

All data within the scheme can be aggregated. APES suggest three aggregation types:

a) Actor group with event (aggregation type I).
b) Phase with actor (aggregation type II).
c) Actor group with phase (aggregation type III, combination of I and II).

All three aggregation types are performed along two distinct dimensions:

- Quantitative participation (sum of all relations, visualized by the size of the nodes in the scheme).
- Qualitative participation (sum of active/ leading relations, visualized by the brightness of the nodes in the scheme).

For each aggregation type all actually existing relations are counted. Whereas the highest sum per actor group or per phase is set as key reference of 100%, all other actor groups or phases are being assessed in relation to this key reference.

For the ***quantitative participation*** all assessed data is filed within a five-scale interval, visualized by five distinct node sizes. The largest node stands for the highest scale, i.e. 100% (see Figure 8.1 below).

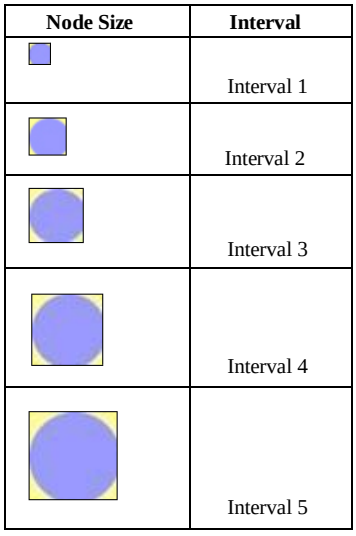


Figure 8.1 Five-scale interval for quantitative participation

As for the ***qualitative participation,*** all assessed data is filed within a three-scale interval, visualized by three distinctive degrees of brightness. The darkest node stands for the highest scale, i.e. 100% (see Figure 8.2).

Brightness of Node	Interval
	Interval 1
	Interval 2
	Interval 3

Figure 8.2 Three-scale interval for qualitative participation

Whereas aggregation types I and II are performed independently from one another, aggregation type III is a combination of I and II. Therefore, all aggregated nodes within aggregation type III are to be understood as an intersection of aggregation types I and II. Each key reference in aggregation type III is therefore assessed in relation to aggregation types I and II.

Please note that all aggregations are always performed in relation to all existing relations within the scheme, including the ones that are not being aggregated. Therefore, if you edit any relation within the scheme, be aware that aggregated nodes may most probably alter as well.

To perform all aggregation types, follow the instructions below:

a) Actor group with event (aggregation type I)

1. Tick the box left of the actor groups you want to be aggregated (see figure 8.3).

2. Make a right-click on your mouse, a window appears

   - Within this window, choose the option “Aggregate selected items” (see figure 8.4 below).

3. If you wish to reset the aggregation feature:

    - Make a right-click on your mouse, a window appears.
    - Within this window, choose the option “Reset Graph”.
    - Deactivate the ticked boxes left of the actor groups by ticking them again.

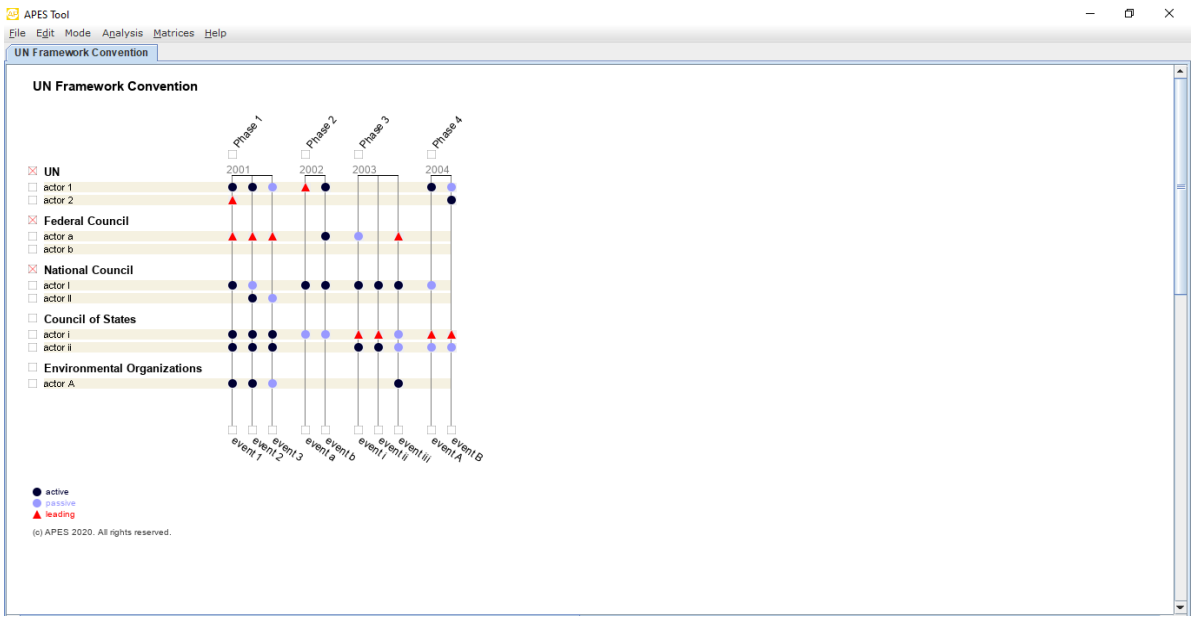


Figure 8.3 Selected actor groups to be aggregated

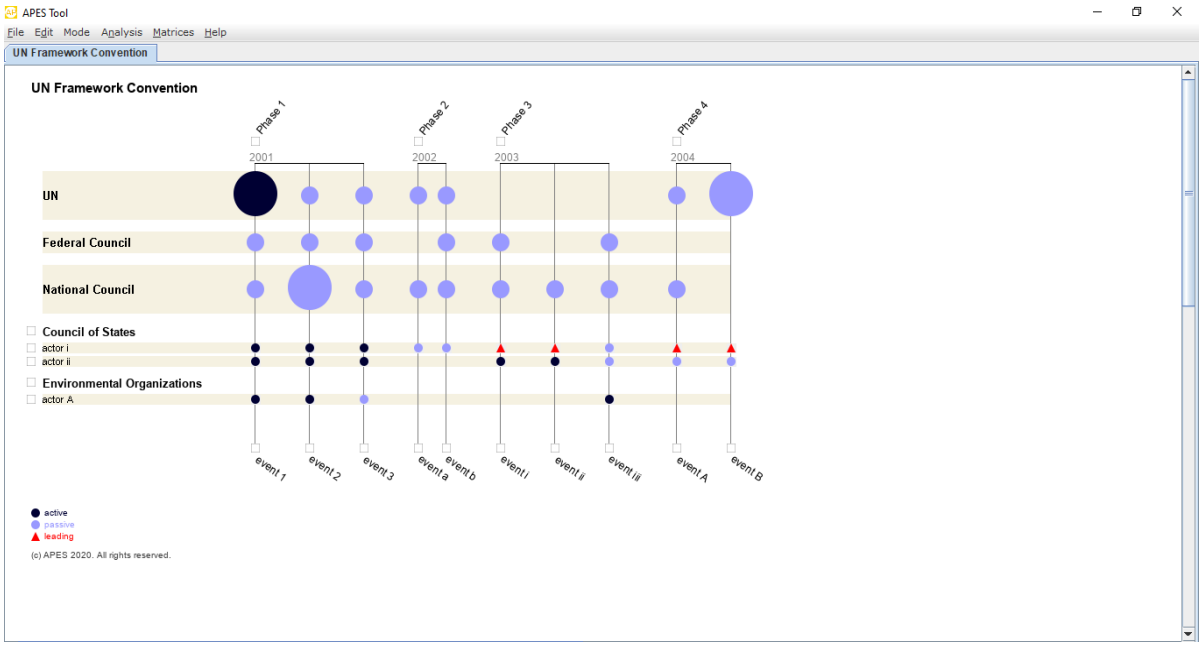


Figure 8.4 Aggregated scheme (aggregation type I)

b) Phase with actor (aggregation type II)

1. Tick the box below the phases you want to be aggregated (see figure 8.5 below).

2. Make a right-click on your mouse, a window appears

   - Within this window, choose the option “Aggregate selected items” (see figure 8.6 below).

3. If you wish to reset the aggregation feature:

   - Make a right-click on your mouse, a window appears.
   - Within this window, choose the option “Reset Graph”.
   - Deactivate the ticked boxes below the phases by ticking them again.

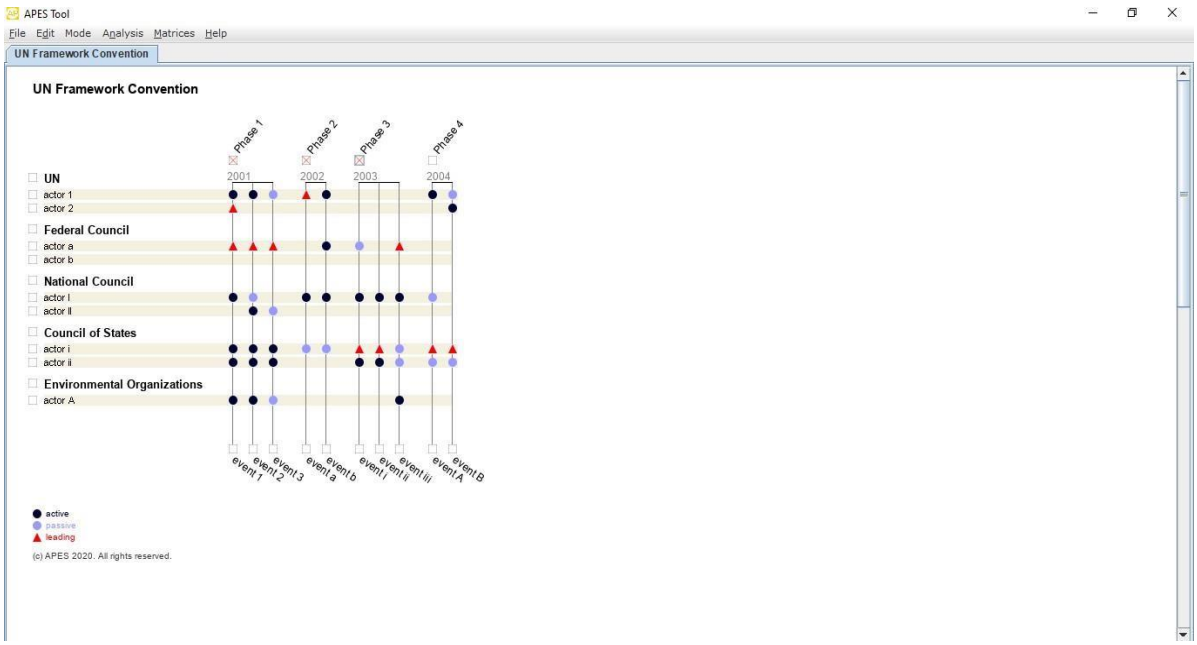


Figure 8.5 Selected phases to be aggregated

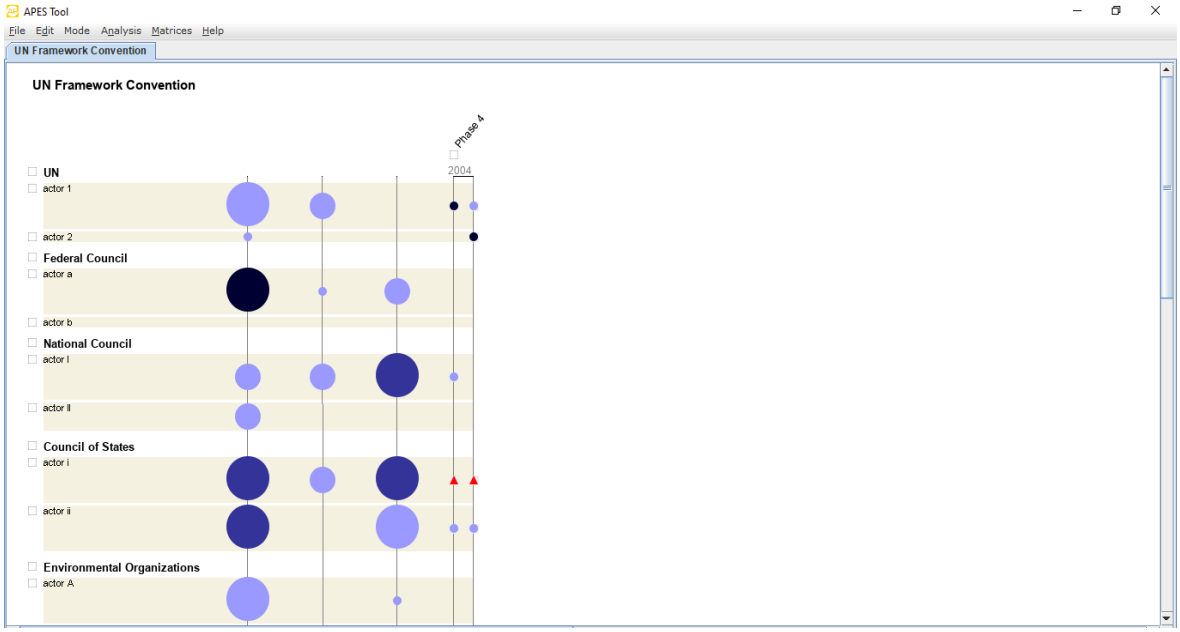


Figure 8.6 Aggregated scheme (aggregation type II)

c) Actor group with phase (aggregation type III)

1. Tick the box left of the actor groups and below the phases you want to be aggregated (see figure 8.7).

2. Make a right-click on your mouse, a window appears

   - Within this window, choose the option “Aggregate selected items” (see figure 8.8 below).

3. If you wish to reset the aggregation feature:

   - Make a right-click on your mouse, a window appears.
   - Within this window, choose the option “Reset Graph”.
   - Deactivate the ticked boxes left of the actor groups, respectively below the phases by ticking them again.

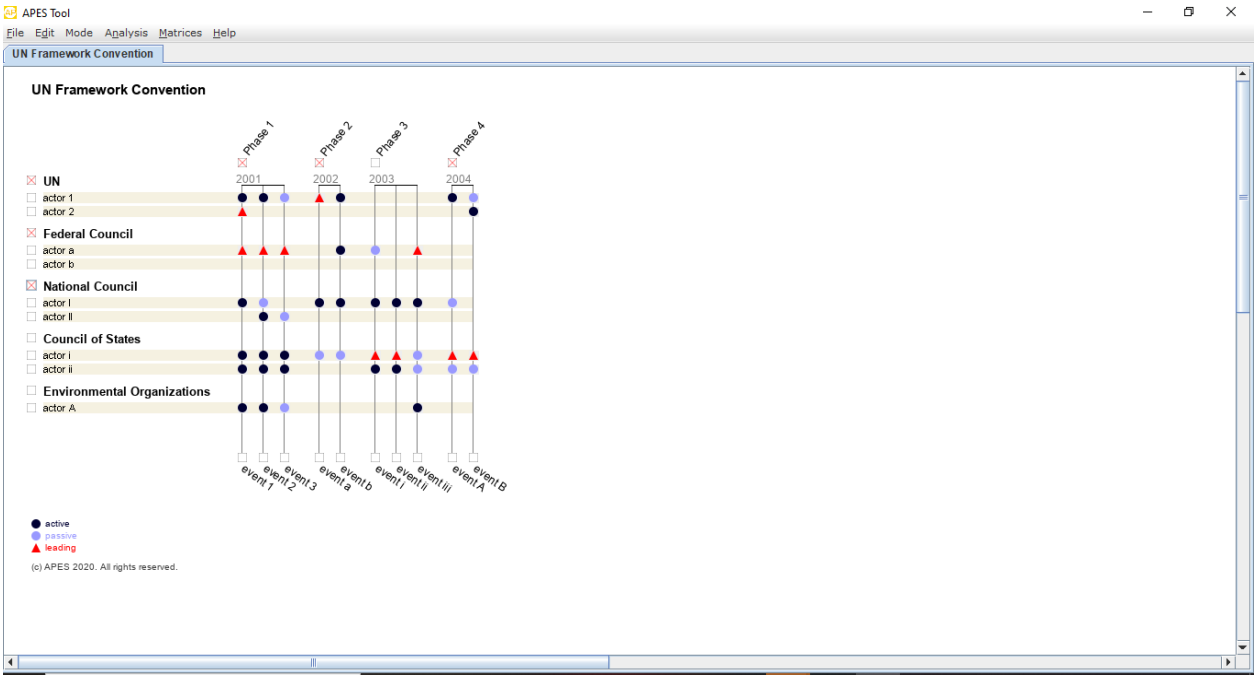


Figure 8.7 Selected actor groups and phases to be aggregated

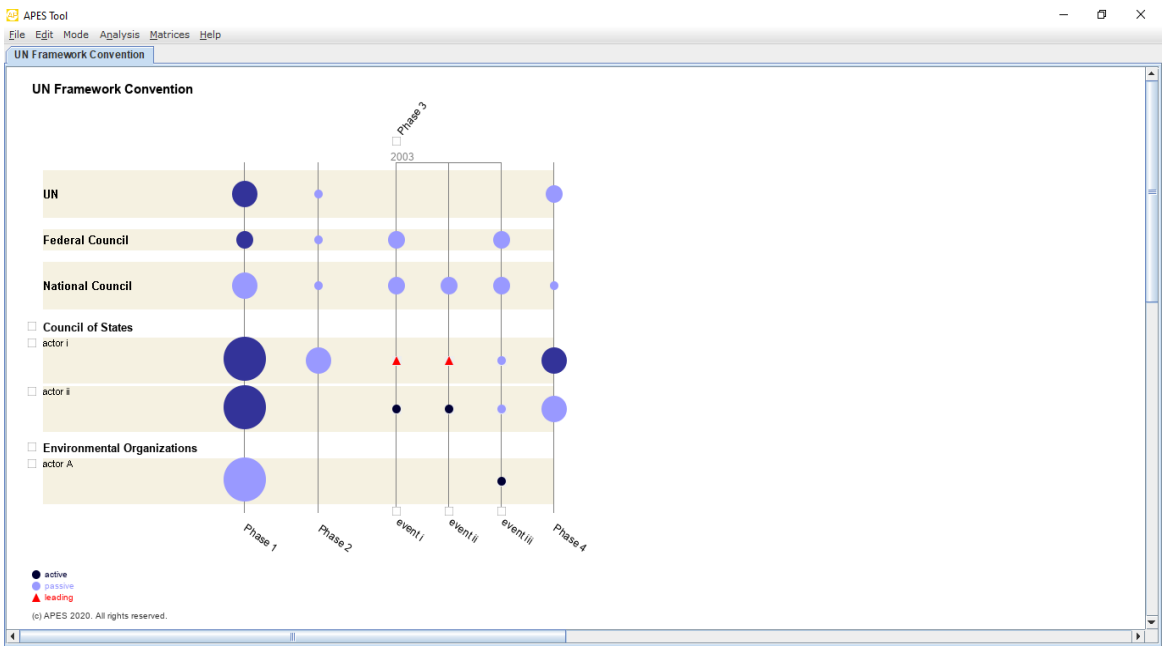


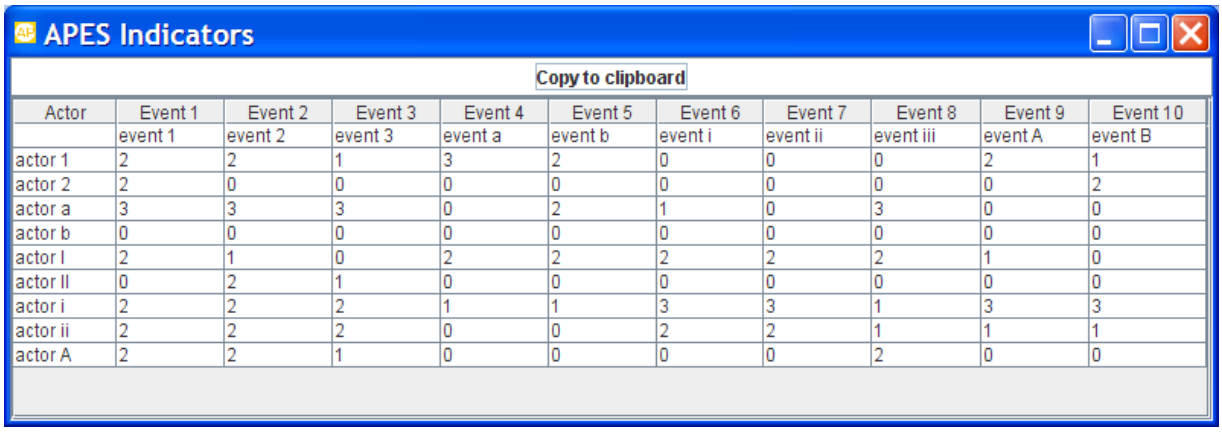
Figure 8.8 Aggregated scheme (aggregation type III)

11. Generate matrices

In its current version, APES generates matrices that can be exported. Two types of matrices can be generated:

a) actor-event matrix
b) actor-actor matrix

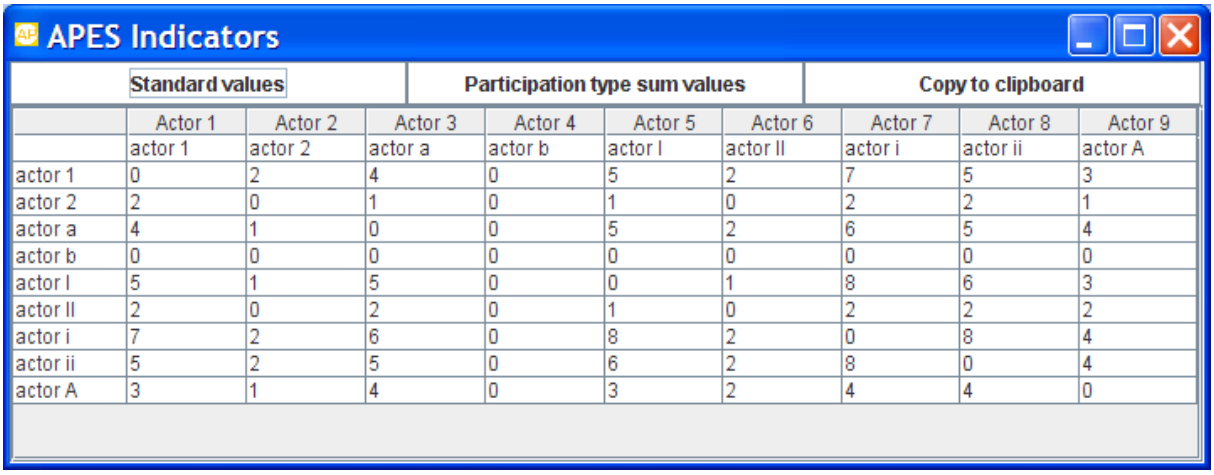
To generate an actor-event matrix go to “Matrices” and choose “Actor-event matrix”. APES then generate a matrix for each actor per event. The values of the matrix correspond with the participation types. If the participation types are being weighted, the corresponding value is being displayed within the matrix (the example below shows weighted values, 1 corresponds to a passive participation, 2 stands for an active, and 3 for a leading participation, see figure 9.1 below).



Actor	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9	Event 10
	event 1	event 2	event 3	event a	event b	event i	event ii	event iii	event A	event B
actor 1	2	2	1	3	2	0	0	0	2	1
actor 2	2	0	0	0	0	0	0	0	0	2
actor a	3	3	3	0	2	1	0	3	0	0
actor b	0	0	0	0	0	0	0	0	0	0
actor I	2	1	0	2	2	2	2	2	1	0
actor II	0	2	1	0	0	0	0	0	0	0
actor i	2	2	2	1	1	3	3	1	3	3
actor ii	2	2	2	0	0	2	2	1	1	1
actor A	2	2	1	0	0	0	0	2	0	0

Figure 9.1 Actor-event matrix

The actor-actor matrix, which is also to be found under "Matrices", aggregates the values edited for the actor-event matrix. Within this feature, you can either choose a standard matrix ("Standard values"), counting the value 1 in case of a relation and 0 in case of no relation, or choose a weighted matrix ("Participation type sum values") that includes the weighted participation types by simply summing them up. With the weighted matrix, the visualization of the actor's position within the network is more pronounced, but does not generate different results however. If an actor gathers a lot of relations with other actors, he will be placed in the center of the network regardless of which matrix, the standard or the weighted one is being applied (see figure 9.2).



	Actor 1	Actor 2	Actor 3	Actor 4	Actor 5	Actor 6	Actor 7	Actor 8	Actor 9
	actor 1	actor 2	actor a	actor b	actor I	actor II	actor i	actor ii	actor A
actor 1	0	2	4	0	5	2	7	5	3
actor 2	2	0	1	0	1	0	2	2	1
actor a	4	1	0	0	5	2	6	5	4
actor b	0	0	0	0	0	0	0	0	0
actor I	5	1	5	0	0	1	8	6	3
actor II	2	0	2	0	1	0	2	2	2
actor i	7	2	6	0	8	2	0	8	4
actor ii	5	2	5	0	6	2	8	0	4
actor A	3	1	4	0	3	2	4	4	0

Figure 9.2 Actor-actor matrix (standard values)

The generated matrices can easily be exported into Excel or other displaying programs:

- Press the “Copy to clipboard”-button on the matrix tables. All information is then copied.
- Open a spreadsheet or editor.
- Make a right-click on your mouse and choose the option “paste”. All data will then be imported into this new table.

12. Generate target diagram (actor-actor graph)

In its current version, APES provides a network feature that displays an actor-actor matrix as a so-called target diagram. With this graph, the nodes are being arranged according to their centrality values[2] on concentric circles with increasing radii. For this procedure, nodes are placed on the radii based on their distance from the center of the diagram. For each node, the distance to the center is computed in proportion to its centrality score. Like this, an increasing distance to the center of the target diagram reflects a decreasing centrality.

Since it is not the goal of our application to implement a complete catalogue of Social Network Analysis (SNA) features - which already exist within other software packages - we decided to provide only one type of centrality measure for plotting the target diagram. We therefore chose Bonacich's (1972) eigenvector centrality.

The basic assumption with Bonacich's computation of eigenvector centrality is that the centrality for a specific node is not to be considered as isolated from the centralities of all other nodes in the network. A node that is connected to other central nodes experiences an additional enhancement of its own centrality and generates a centrality augmentation for all other nodes that are connected to it as well. In this context, Bonacich developed a set of so-called local (focused on only one node) and global (with a broader focus on several nodes) centrality measures which are weighted. With the introduction of a weighting parameter into his formula, Bonacich suggests the insertion of a positive or negative value which stands pro or contra the allowance of path distances between nodes. If path distances are being considered - as APES does -, not only directly, but also indirectly linked nodes are integrated into the centrality computation.

To generate a target diagram with APES[3],

1. Display the scheme you want to plot as target diagram within the actor-event (edit) mode.

2. Go to “Mode” and choose “Actor-Actor”. The target diagram for this scheme is being plotted (see figure 10.1 below). Actors that come under the same actor group will have same color. The current version supports 24 colors. Thus, a maximum of 24 actor groups can exist. More than that will result in a common color.

3. For editing the target diagram:

    - Make a right-click on your mouse, a window appears.

    - By default, APES chooses the maximum and minimum eigenvector centrality value (in percent) for plotting the radii of the diagram. You can however edit these maximum- and minimum-values by directly writing into the corresponding fields (see figure 10.2 below).

4. If you do not want to display the actor labels or the connecting lines, i.e. arrows, click on the corresponding boxes so that the tick marks disappear.

[2] In Social Network Analysis (SNA), centrality values can be computed for each node. There exist several centralities that all express a slightly different alignment (for a well-founded overview see Wasserman/Faust 1994, Scott 2000). The most popular centrality values are the ones conceptualized by Freeman (1979, degree, closeness and betweenness centrality), as well as Bonacich's (1972) eigenvector centrality.

[3] In its current version, APES use the standard actor-actor matrix for plotting the target diagram.

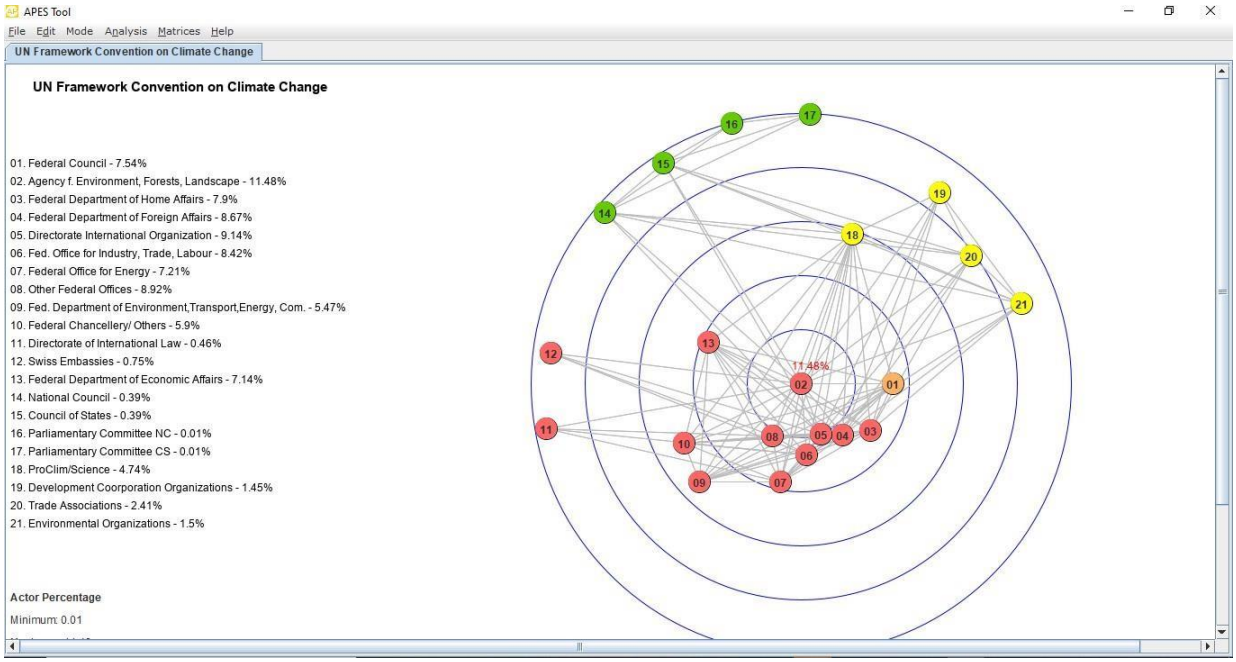


Figure 10.1 Actor-actor target diagram

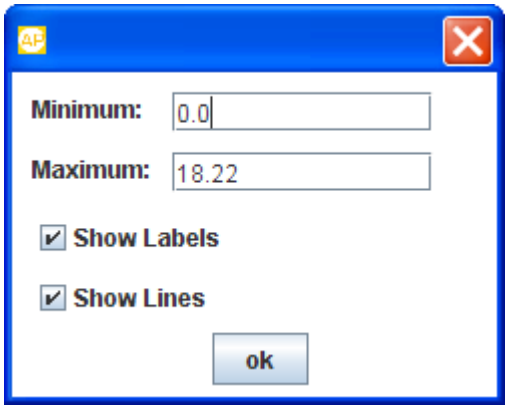


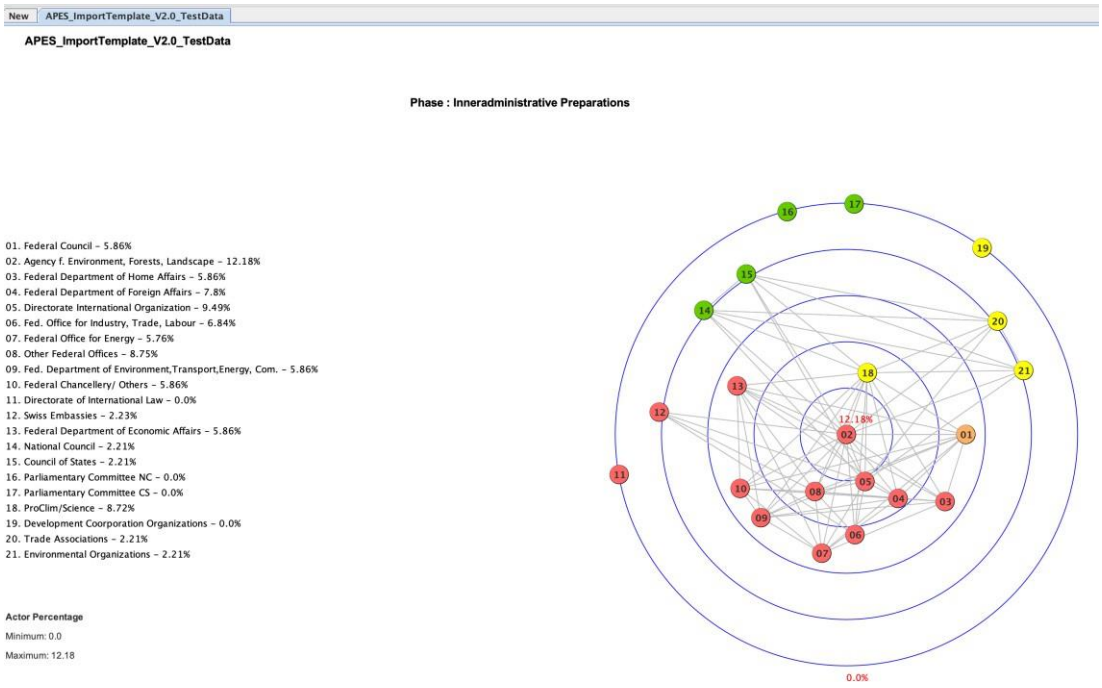
Figure 10.2 Editing feature for actor-actor target diagram

13. Filter target diagram by phase

To generate a filtered target diagram with APES[3],

1. Display the scheme you want to plot as target diagram within the actor-event (edit) mode.

2. Go to “Mode” and choose “Actor-Actor By Phase”. The target diagram for each different phase of the scheme is being plotted. Scroll down the apes pane to view all the diagrams. All the diagrams can be exported separately using the existing export diagram option.



14. APES Analysis

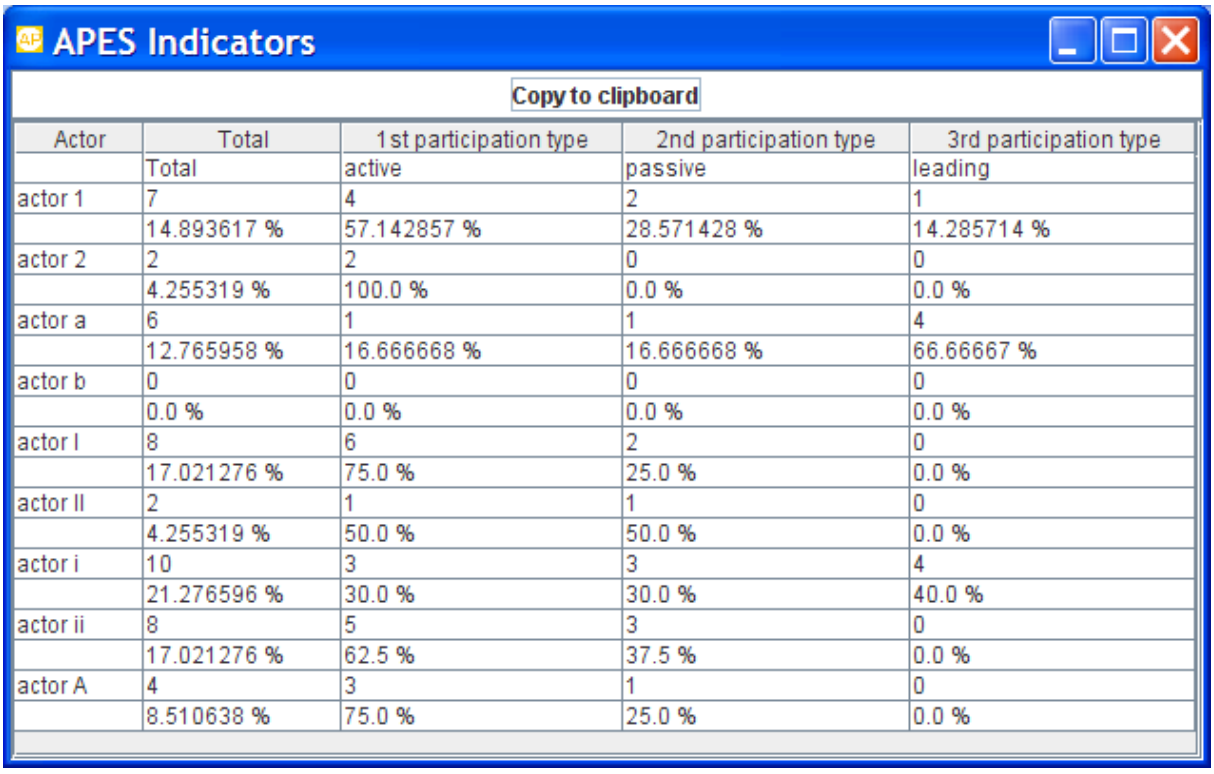
In its current version, APES provides six analytical features, including density and centralization i.e. indicators. These are:

a) actor participation
b) phase duration
c) actor per phase participation

d) actor-actor centralities (eigenvector centrality)
e) network density
f) centralization

a) The ***actor participation analysis*** computes the 'total participation per actor' (absolute and relative figures), as well as the 'total participation per actor per participation type' (absolute and relative figures) for the whole process.

To run the actor participation analysis, go to "Analysis" and choose "Actor participation" (see figure 11.1).



Actor	Total	1st participation type	2nd participation type	3rd participation type
	Total	active	passive	leading
actor 1	7	4	2	1
	14.893617 %	57.142857 %	28.571428 %	14.285714 %
actor 2	2	2	0	0
	4.255319 %	100.0 %	0.0 %	0.0 %
actor a	6	1	1	4
	12.765958 %	16.666668 %	16.666668 %	66.66667 %
actor b	0	0	0	0
	0.0 %	0.0 %	0.0 %	0.0 %
actor I	8	6	2	0
	17.021276 %	75.0 %	25.0 %	0.0 %
actor II	2	1	1	0
	4.255319 %	50.0 %	50.0 %	0.0 %
actor i	10	3	3	4
	21.276596 %	30.0 %	30.0 %	40.0 %
actor ii	8	5	3	0
	17.021276 %	62.5 %	37.5 %	0.0 %
actor A	4	3	1	0
	8.510638 %	75.0 %	25.0 %	0.0 %

Figure 11.1 Actor participation analysis

b) The ***phase duration analysis*** computes the 'total duration of all distinct phases of the process' in absolute (counted in days, from the first to the last date of each phase) and relative figures.

To run the phase duration analysis, go to "Analysis" and choose "Phase duration".

c) The *actor per* ***phase participation analysis*** computes the 'total actor participation type per each phase and actor group' (absolute and relative figures).

To run the actor per phase participation analysis, go to "Analysis" and choose "Actor/phase participation".

d) The ***actor-actor centralities*** (eigenvector centrality) are the values that are being computed for the plotting of the target diagram (relative figures). With this feature, all values are displayed in one separate table.

To run the actor-actor centralities analysis, go to "Analysis" and choose "Actor-actor centralities".

Please take note that for generating the actor-actor centralities, first the corresponding actor-actor graph (target diagram, see Step 10 of this manual) must be plotted.

e) The ***network density*** is defined to be the ratio of the number of edges with respect to the maximum possible edges. This value provides a measure of how interconnected the nodes in the network are, expressed as a number between 0 and 1. The calculated density values are displayed in a table

To perform the network density analysis, start by generating the target diagram. Navigate to the "Mode" menu and select the "Actor-Actor" mode. Then, go to the "Analysis" menu and choose the "Network Density" option..

f) The ***centralization*** measures how centralized a network is by analyzing the variation in centrality values across all nodes. To calculate network centralization, first determine the centrality of each individual node. Then, subtract each node's centrality value from the maximum centrality value in the network and sum up these differences. Then you must divide the resulting value by (n-1) * (n-2) (n represents number of actors).

To perform the network density analysis, start by generating the target diagram. Navigate to the "Mode" menu and select the "Actor-Actor" mode. Then, go to the "Analysis" menu and choose the "Network Density" option.

The generated analysis tables can easily be exported into Excel or other displaying programs:

- Press the “Copy to clipboard”-button on the analysis tables.
- All information is then copied.
- Open Excel (or other displaying programs).
- Make a right-click on your mouse and choose the option “paste”. All data will then be imported into this new table.

15. Export a scheme/ display several schemes

Export a scheme

APES offers several file formats for exporting a scheme/ target diagram.

a) Save as xml-file:

- Go to “File”.
- Choose the option “Save as xml” or use shortcut Ctrl-S.
- Enter correct path (keep the suggested suffix (.apes), if you wish to reopen the file with APES).

b) For all other formats:

- Go to “File”.
- Choose the option “Export actor-event graph” also use shortcut Ctrl-E (for saving APES scheme) or “Export actor-actor graph” also use shortcut Ctrl-A (for saving APES target diagram), a window opens.
- Choose the preferred file format and enter the correct path.

Graphs can be exported to the following file formats: EPS, SVG, PNG and PDF.

From a graphical point of view, EPS - (Encapsulated PostScript) and SVG - formats (Scalable Vector Graphics) are of a very high quality. For editing both formats, additional image editors like Adobe Illustrator, Inkscape[4], Gimp[5], or others are needed, though.

In this version of APES Tool, the export quality of the images in all formats has been increased to a minimum of 300 dpi.

Display/ close several schemes

Within APES several schemes can be displayed at the same time, the application then generates a header for each scheme. For switching from one scheme to the other, just click on the corresponding header.

For closing one scheme:

- Display the scheme you want to close.
- Go to “File”.
- Choose “Close”, the selected scheme will be closed by the application.

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- BORGATTI, Stephen P., EVERETT, Martin G. and Linton C. FREEMAN (2002): Ucinet 6 for Windows: Software for Social Network Analysis. Harvard: Analytic Technologies.

- FREEMAN, Linton C. (1979): "Centrality in Social Networks. Conceptual Clarification", Social Networks, 1(3), pp. 215-239.

- SCOTT, John (2000): Social Network Analysis: A Handbook. London: Sage.

- WASSERMAN, Stanley and Katharine FAUST (1994): Social Network Analysis: Methods and Applications. Cambridge: Cambridge University Press.

[4] Download Inkscape for free: http://www.inkscape.org

[5] Download GIMP for free: http://www.gimp.org